

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-20 Canceled.

Claim 21 (New): Coated tool for machining, said coated tool comprising a substrate having a predetermined coefficient of thermal expansion, a first carbon layer which is deposited on the substrate, said first carbon layer has a predetermined highly predominant fraction of 80-100% of carbon with a diamond crystal structure and a coefficient of thermal expansion which is smaller than the coefficient of thermal expansion of the substrate; and at least one second carbon layer, which is deposited and spaced from the substrate by at least the first carbon layer wherein said second carbon layer has a fraction of carbon with a diamond crystal structure which is 80-100% but lower than the predetermined fraction of carbon with a crystal diamond structure in the first carbon layer, and wherein said second carbon layer has a coefficient of thermal expansion that is greater than the coefficient of thermal expansion of the first carbon layer, and said second carbon layer consists of nano-crystalline diamond.

Claim 22. (New) Tool according to Claim 21 further comprising an interlayer positioned between the first carbon layer and the second carbon layer, and wherein the fraction of carbon with a diamond crystal structure drops continuously from the first carbon layer in the direction of the second carbon layer.

Claim 23. (New) Tool according to Claim 21 wherein an overall thickness of the first carbon layer and the second carbon layer is about 1 to 40 μm .

Claim 24. (New) Tool according to Claim 23 wherein the overall thickness of the first carbon layer and the second carbon layer is about 4 to 20 μm .

Claim 25. (New) Tool according to Claim 24 wherein the overall thickness of the first carbon layer and of the second carbon layer is about 6 to 15 μm .

Claim 26. (New) Tool according to Claim 21 wherein the second carbon layer has a minimum thickness of 0.5 μm .

Claim 27. (New) Tool according to claim 26 further comprising at least one layer of a material arranged between the first carbon layer and the second carbon layer.

Claim 28. (New) Tool according to Claim 21 further comprising at least one layer of a material spaced from said substrate by at least said second carbon layer.

Claim 29 (New): Coated tool for machining, said coated tool comprising a substrate having a predetermined coefficient of thermal expansion, a first carbon layer which is deposited on the substrate, said first carbon layer has a predetermined highly predominant fraction of 80-100% of carbon with a diamond crystal structure and a coefficient of thermal expansion which is smaller than the coefficient of thermal expansion of the substrate; and at least one second carbon layer, which is deposited and spaced from the substrate by at least the first carbon layer wherein said second carbon layer has a fraction of carbon with a diamond crystal structure which is 80-100% but lower than the predetermined fraction of carbon with a crystal diamond structure in the first carbon layer, wherein said second carbon layer has a coefficient of thermal expansion that is greater than the coefficient of thermal expansion of the first carbon layer, said second carbon layer consists of nano-crystalline diamond; and wherein the second carbon layer is deposited directly on the first carbon layer.

Claim 30. (New) Tool according to Claim 29 wherein an overall thickness of the first carbon layer and the second carbon layer is about 1 to 40 μm .

Claim 31. (New) Tool according to Claim 29 wherein the second carbon layer has a minimum thickness of 0.5 μm .

Claim 32 (New): Coated tool for machining, said coated tool comprising a substrate, a first carbon layer which is deposited on the substrate, said first carbon layer has a predetermined highly predominant fraction of 80-100% of carbon with a diamond crystal structure; and at least one second carbon layer, which is deposited and spaced from the substrate by at least the first carbon layer wherein said second carbon layer has a fraction of carbon with a diamond crystal structure which is 80-100% but lower than the predetermined fraction of carbon with a crystal diamond structure in the first carbon layer, and wherein said second carbon layer consists of nano-crystalline diamond.

Claim 33. (New) Tool according to Claim 32 wherein an overall thickness of the first carbon layer and the second carbon layer is about 1 to 40 μm .

Claim 34. (New) Tool according to Claim 32 wherein the second carbon layer has a minimum thickness of 0.5 μm .

Claim 35 (New): Coated tool for machining, said coated tool comprising a substrate, a first carbon layer which is deposited on the substrate, said first carbon layer has a predetermined highly predominant fraction of 80-100% of carbon with a diamond crystal structure; and at least one second carbon layer, which is deposited and spaced from the substrate by at least the first carbon layer wherein said second carbon layer has a fraction of carbon with a diamond crystal structure which is 80-100% but lower than the predetermined fraction of carbon with a crystal diamond structure in the first carbon layer, wherein said second carbon layer consists of nano-crystalline diamond; and wherein the second carbon layer is deposited directly on the first carbon layer.

Claim 36. (New) Tool according to Claim 35 wherein an overall thickness of the first carbon layer and the second carbon layer is about 1 to 40 μm .

Claim 37. (New) Tool according to Claim 35 wherein the second carbon layer has a minimum thickness of 0.5 μm .

Claim 38. (New) Process for producing a tool substrate which is coated with carbon and has a predetermined coefficient of thermal expansion, said process comprising the steps of:

- a) depositing a first carbon layer onto the tool substrate and selecting process conditions such that the first carbon layer contains a predetermined highly predominant fraction of carbon with a diamond crystal structure and has a smaller coefficient of thermal expansion than the tool substrate; and
- b) depositing a second carbon layer such that at least said first carbon layer separates said second carbon layer and said substrate and selecting process conditions such that the second carbon layer has a highly predominant but reduced proportion of carbon with a diamond crystal structure relative to the predetermined fraction of carbon with a diamond structure of the first layer, a larger coefficient of thermal expansion than the first carbon layer, and consists of nano-crystalline diamond.

Claim 39. (New) Process according to Claim 38 wherein in step a) the process conditions are selected such that the first carbon layer has a high as possible a fraction of carbon with diamond crystal structure.

Claim 40. (New) Process according to Claim 38 wherein in step b) the process conditions of step a) are changed to reduce the fraction of carbon with a diamond crystal structure by comparison with the first carbon layer.

Claim 41. (New) Process according to Claim 39 wherein in step b) the process conditions of step a) are changed to reduce the fraction of carbon with a diamond crystal structure by comparison with the first carbon layer.

Claim 42. (New) Process for producing a tool substrate which is coated with carbon, said process comprising the steps of:

- c) depositing a first carbon layer onto the tool substrate and selecting process conditions such that the first carbon layer contains a predetermined highly predominant fraction of carbon with a diamond crystal structure; and
- d) depositing a second carbon layer such that at least said first carbon layer separates said second carbon layer and said substrate and selecting process conditions such that the second carbon layer has a highly predominant but reduced proportion of carbon with a diamond crystal structure relative to the predetermined fraction of carbon with a diamond structure of the first layer and consists of nano-crystalline diamond.